SONY

3-752-034-21 (2)

Video Camera Recorder 8

CCD-TR4

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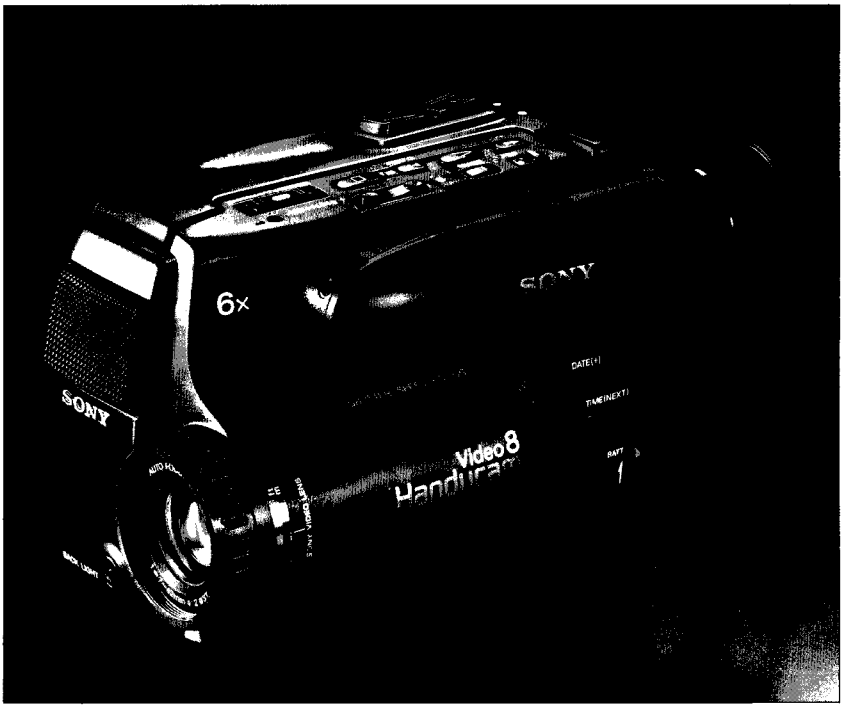
NATIONAL TECHNICAL DEPT.

FILE COPY

Operating Instructions

Before operating the unit, please read this manual thoroughly and retain it for future reference.



Video 8 Handycam

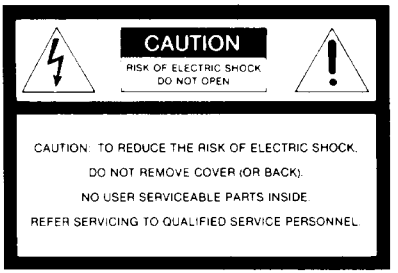
©1990 by Sony Corporation

The model number and serial numbers are located on the bottom. Record the serial number in the space provided below. Refer to these numbers whenever you call upon your Sony dealer regarding this product.

Model No. CCD-TR4 Serial No. _____

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.


CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK).
NO USER SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

INFORMATION for the customers in the U.S.A.
This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient the receiving antenna
Relocate the equipment with respect to the receiver
Move the equipment away from the receiver
Plug the equipment into a different outlet so that equipment and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to Identify and Resolve Radio-TV Interference Problems".

This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

For the customers in Canada
This apparatus complies with the Class B limits for radio noise emissions set out in Radio Interference Regulations.

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Overview of the CCD-TR4

The CCD-TR4 Video 8 Handycam is a compact color video camera/recorder (camcorder).
You can use it to shoot the pictures you want and play them back on your television set.
The camcorder uses 8 mm video-format cassettes.

Who this Manual is for

This manual is for you. You can use this manual to find exactly the information you need, whether you are familiar with video equipment or not.

How the Manual is Organized

The first section of the manual explains the preliminary steps necessary to prepare for shooting and playing back.

Other sections include shooting procedures that show you how to use the various features and functions of your camcorder. If you are beginner, start with "Recording with automatic adjustments." If you are very familiar with camcorders, try to shoot your picture with manual adjustments as well as automatic adjustments.
If you want to record right away, see p. 10, 11 and 19 through 22.

The manual also includes information on how to play back a picture on a TV and how to edit your original 8 mm tape onto another video tape.

If you have any problems during operation, see the "Trouble Check" section.

How this Manual Works

Use the information below to help you follow the instructions in this manual.

- Controls and settings on the camcorder are shown in capital letters:
  ex. Set POWER to CAMERA.
- The letter in an illustration corresponds to the letter in the text:
  ex. (A-1) or **[a]**
- The step numbers in all illustrations correspond to the step numbers in the text.
- Notes and caution massages are set off with lines.

ex.

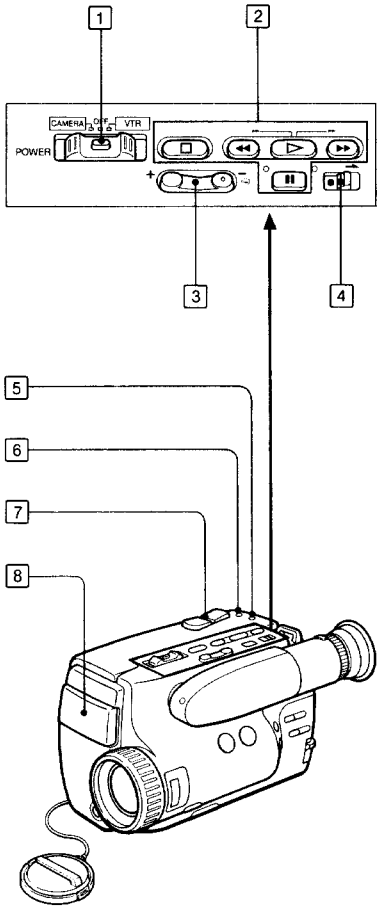
Note on battery life
Battery will not last as long in cold places.

Supplied Accessories

The camcorder is packed together with the following units. Check to see that everything is contained in the package.
(*Attached to the camcorder)

- Battery pack NP-55 (1)
- AC power adaptor AC-V30 (1)
- Lithium battery CR2025 (1)
- RFU adaptor RFU-90UC (1)
- Step-up-ring ϕ37 mm to ϕ46 mm ($\phi 1\frac{1}{2}$" to $\phi 1\frac{13}{16}$") (1)
- Shoulder strap (1)
- Jack cover (1)*
- Lens cap (1)*
- Handy manual

(A-1)



For details on the use of each control, refer to the pages indicated in the circle.

(A-1)

1 POWER switch
CAMERA: For camera recording
VTR: For playing back or editing tapes
OFF: Power off

2 Tape transport buttons and pause indicator
▷ (playback)
▶▶ FF (fast forward)
◀◀ REW (rewind)
□ (stop)
❚❚ (pause)
During the pause mode the indicator lights.

3 EDITSEARCH ⇆ button ㉓, ㉕

4 ● REC (recording) switch and recording indicator
Slide in the direction of the arrow for recording.
During recording the indicator lights.

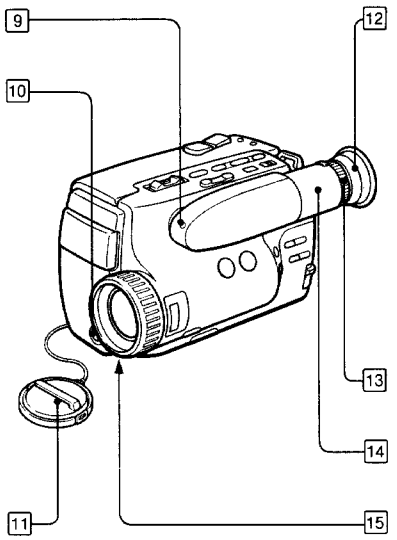
5 Caution lamp
Blinks when a problem has occurred.

6 DEW lamp
Blinks when moisture has condensed inside the unit.

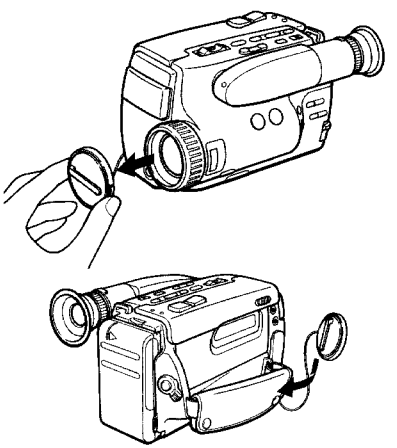
7 Power zoom button ㉗, ㉚, ㉜

8 Built-in microphone

(A-2)



(A-3)



(A-2)

9 **Camera recording/battery lamp**
Lights during camera recording. It blinks when the battery is exhausted.

10 **BACK LIGHT button**

11 **Lens cap**
To remove the lens cap, squeeze the sides as shown.
Hook it on the grip strap. **(A-3)**

12 **Eyecup**

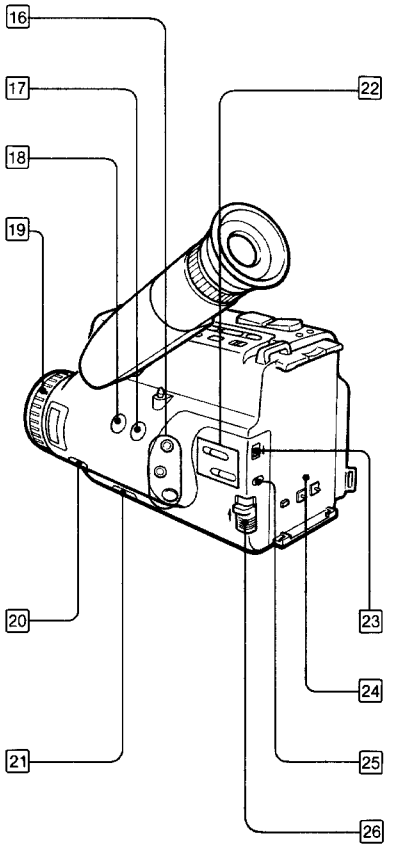
13 **Viewfinder lens adjustment ring**
Adjust to your eyesight to assure good focus. Be sure to adjust this ring when shooting for the first time.

14 **Viewfinder**
The picture being recorded or played back can be monitored in monochrome here. Also marks such as the caution indicators and function modes appear in here.

15 **REMOTE control jack (stereo mini-mini jack)**
Connect a wired remote control unit, an editing controller, or other equipment here.

About (LANC)
stands for Local Application Control Bus System. The connector is used for controlling the tape transport of video equipment and the peripherals connected to it. This connector has the same function as the connectors indicated as CONTROL L or REMOTE.

(A-4)



(A-4)

16 **Superimpose buttons** ㉝
MEMORY button
COLOR button
SUPERIMPOSE button

17 **FOCUS button** ㉗
Used for manual focusing.

18 **SHUTTER SPEED button** ㉙
Used to select the shutter speed.

19 **Focus ring** ㉗

20 **Macro set button** ㉜

21 **Lithium battery compartment** ⑰

22 **DATE and TIME buttons**
Press to display or turn off the date or time.

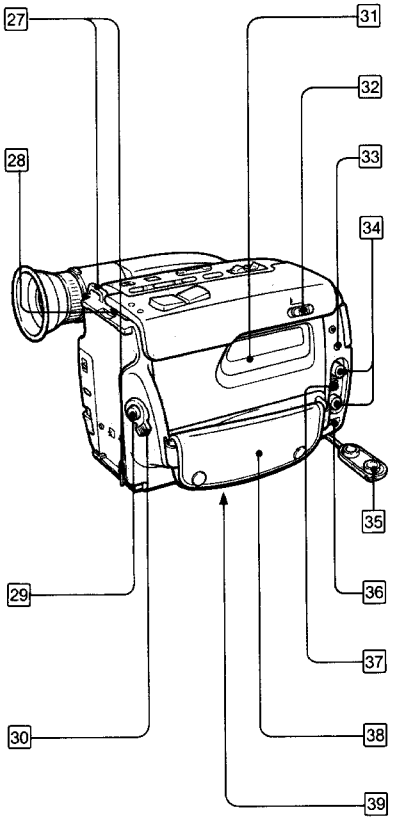
23 **EDIT switch** ⑱
Normally set to the upper position. When editing tapes, set in the direction of the arrow.

24 **Battery mounting surface**

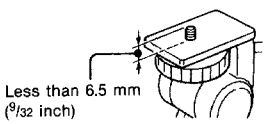
25 **COUNTER RESET (CAMERA) button** ㉓

26 **BATT (battery eject) knob** ⑪

(A-5)



(A-6)



(A-5)

27 **Hooks for shoulder strap**
Attach the shoulder strap.

28 **EJECT (cassette eject) button**

29 **START/STOP button**
Press to start and stop camera recording.

30 **STANDBY switch**
Turn to STANDBY to set the camcorder to the standby mode.

31 **Cassette compartment**

32 **Lid lock**
Slide in the direction of the arrow to open the cover.

33 **MIC jack (PLUG IN POWER)**
Connect a Sony "Plug-in-power" microphone (not supplied). This jack also supplies power to it.

34 **VIDEO/AUDIO jacks (phono jacks)**

35 **Jack cover**
Cover the VIDEO/AUDIO jacks when not in use.

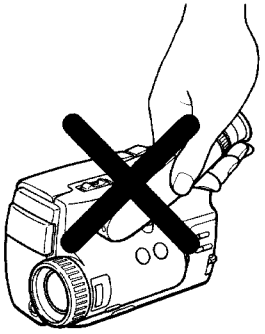
36 **INPUT/OUTPUT selector**
For input: Slide to INPUT.
For output: Slide to OUTPUT.

37 **RFU DC OUT (RFU adaptor DC output) jack (special minijack)**
Attach the supplied RFU adaptor here if you use it.

38 **Grip strap**
Adjust the length so that your thumb can easily manipulate the START/STOP button.

39 **Tripod receptacle**
Note when attaching a tripod other than Sony's, the length of the camera mounting screw must be less than 6.5 mm (9/32 inch). Otherwise the screw may damage the inner parts of the camera. **(A-6)**

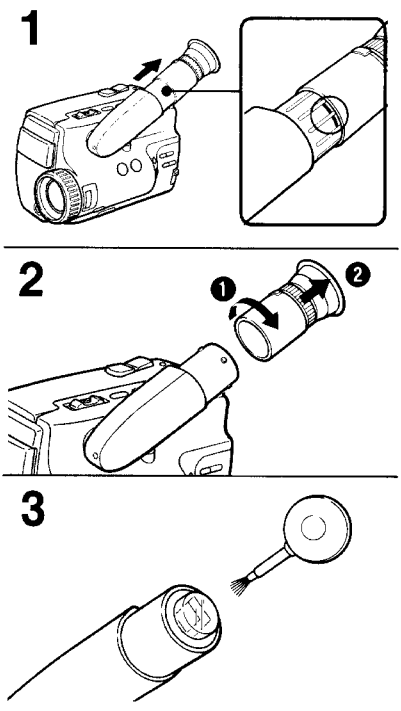
(A-7)



Caution (A-7)

Do not pick up the unit grasping the viewfinder.

(A-8)



To remove dust from inside the viewfinder (A-8)

1 **Pull out until the mark appears.**

2 **Turn counterclockwise until the viewfinder stops and pull it out.**

3 **Clean the surface of the cover with a blower.**

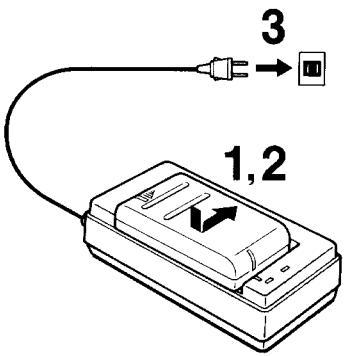
Connecting the Power Sources

First Choose the Power Source

Place	Power source	Accessory to be used
Outdoors	Battery pack	Battery pack NP-55 (supplied), NP-66H, NP-77, NP-77H
	Alkaline batteries	Battery case EBP-55
Indoors	House current	AC power adaptor AC-V30 (supplied), AC-V55
In the car	12 V or 24 V car battery	DC pack DCP-77, DCP-55 (DCC-16B car battery cord supplied)

Note on power source
Disconnecting the power source or removing the battery pack during recording or playback may damage the inserted tape. If disconnected accidently, supply the power again immediately.

(B-1)



Using the Battery Pack

Step 1

Charge the battery pack. **(B-1)**

1 **Align the right side of the battery pack with the line on the AC power adaptor.**

2 **Slide in the battery pack to the right.**

3 **Connect the AC power adaptor to a wall outlet.**
Charging will begin.

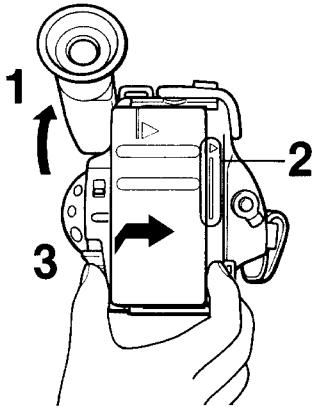
Required charging time

NP-55	NP-66H	NP-77	NP-77H
60	110	120	140

(Approx. minutes when using AC-V30)

See the instruction manual of the AC power adaptor for details.

(B-2)



Step 2

Mount the battery pack on the camcorder. **(B-2)**

1 Lift up the viewfinder.

2 Align the right side of the battey pack with the line on the camcorder.

3 Slide the battery pack to the right.

Note

Make sure the battery fits completely on the mounting surface of the camcorder. Imperfect fit may damage the projections on the camcorder.

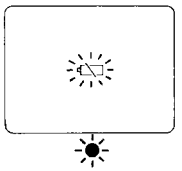
Battery life

A fully charged battery pack lasts for:

NP-55	NP-66H	NP-77	NP-77H
70	120	140	170

(Approx. minutes, continuous recording when used indoors)

(B-3)



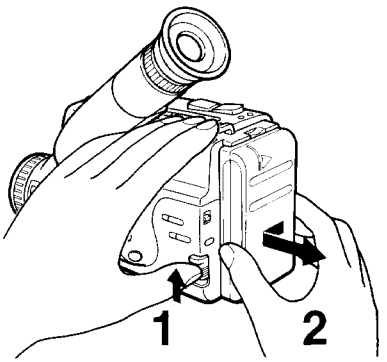
When the battery becomes weak (B-3)

The ⌧ indication and red lamp blink slowly in the viewfinder. Replace the battery pack with a fully charged one when they blink rapidly.

To remove the battery pack (B-4)

While sliding up the BATT knob, slide the battery pack to the left and pull it out as illustrated.

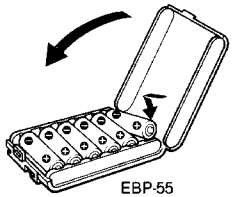
(B-4)

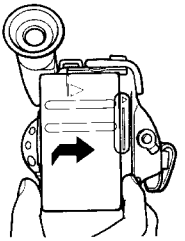


Other options for charging

- AC-V55 AC power adaptor: You can charge two battery packs one after another.
- BC-55, BC-77 portable battery charger: You can charge a battery pack on 100 – 240 V AC.
- DC-V30 car battery charger: You can charge a battery by connecting the car battery charger to the cigarette lighter socket. This battery charger can also supply power for Sony 8 mm video equipment that operates on a battery pack.
- NP-4000 rechargeable battery pack: You can use it for long outdoor recording. The DCP-55 DC pack is required for the connection (not supplied).

(B-5)





Using Alkaline Batteries

(B-5)

The EBP-55 battery case is required (not supplied.)

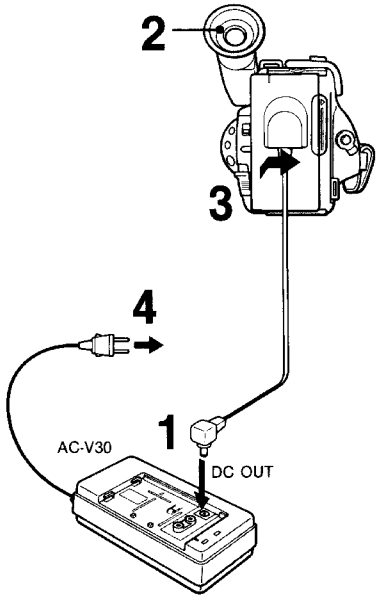
1 Insert 6 AA size alkaline batteries into the battery case.

2 Attach the case in the same way as the battery pack.

Battery life
Approx. 70 minutes using Sony alkaline batteries (continuous recording when operated indoors)

Notes on battery life
- Batteries will not last as long in cold places.
- No indication appears in the viewfinder when the batteries are weak.

(B-6)



Using House Current

(B-6)

Use the supplied AC-V30 AC power adaptor.

1 Insert the connecting cord supplied with the AC-V30 AC power adaptor into the DC OUT jack on the AC power adaptor.

2 Lift up the viewfinder.

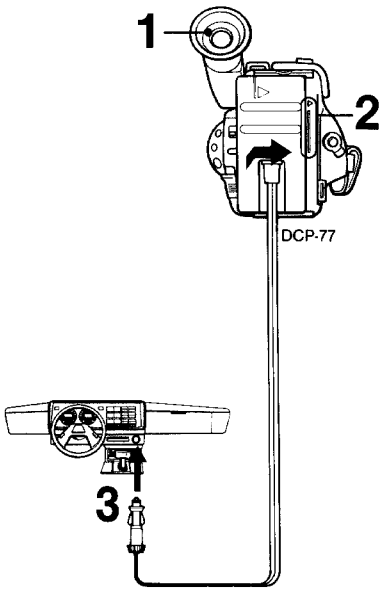
3 Align the right side of the connecting plate with the line on the camcorder, and slide it in to the right.

4 Connect the AC power adaptor to a wall outlet.

We recommend the use of the AC power adaptor while viewing the playback picture on the TV, editing tapes or recording a TV program, as you do not need to worry about running out of power.
See the instruction manual of the AC power adaptor for details.

Other option
The AC-V55 AC power adaptor can also be used.

(B-7)



Using Car Battery

(B-7)

The DCP-77 DC pack is required (not supplied).

1 Lift up the viewfinder.

2 Align the right side of the DC pack with the line on the camcorder, and slide it in to the right.

3 Connect the cord to the cigarette lighter socket of a car (12 V or 24 V).

To remove the DC pack

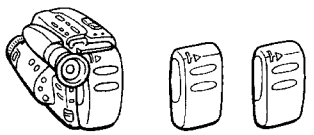
While sliding up the BATT knob on the camcorder, slide the DC pack to the left and pull it out.

Other options

- The DCP-55 DC pack can be used.
- You can also operate this camcorder on a 12 V or 24 V car battery using the AC-V55 AC power adaptor and the DCC-16AW car battery cord.

The Best Way to Use the Battery Pack

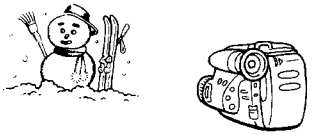
(C-1)



How to Prepare the Rechargeable Battery Pack

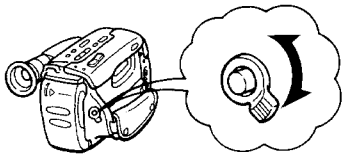
Have a sufficient battery pack power to do 2 or 3 times as much recording than you have planned. (C-1)
"Battery life" as indicated in the instruction manual or catalogue of the camcorder is measured by the continuous recording time of the camcorder, placed at a room temperature using a full-charged battery.

(C-2)



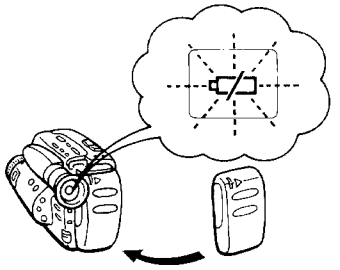
Battery life is shorter in a cold climate (C-2)
Battery efficiency is decreased and the battery will be used up more quickly.

(C-3)



Turn the STANDBY switch of the camcorder to LOCK when not recording to save battery power. (C-3)
A smooth transition between scenes can be made even if recording is stopped and started again.
While positioning the subject or selecting an angle, by viewing through the viewfinder, and in using autofocus the battery is being expended. The battery is also being expended when a tape is inserted or removed.

(C-4)

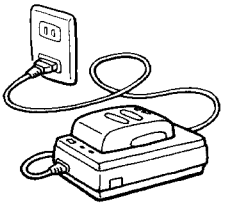


When the Rechargeable Battery Pack should be Replaced

(C-4)

When the ◁▷ mark in the viewfinder changes from slow blinking to rapid blinking while you are recording,
Turn off the power switch of the camcorder and replace the battery pack. Leave the tape in the camcorder in order to obtain a smooth transition between scenes after the battery pack is replaced.

(C-5)



Notes on Charging

(C-5)

Before using the battery pack, charge it sufficiently. A brand-new battery pack is not charged.

Recharge the battery pack only when it is exhausted.

- If recording is completed before the mark appears in the viewfinder, it is recommended that you remove the tape, set POWER to CAMERA, Turn STANDBY to STANDBY, and leave the camcorder until the ⏏ mark blinks rapidly.
- Repeated charging while some capacity remains causes a lowering of battery capacity. However, **the original battery capacity can be recovered if you fully discharge and charge the battery again.**

Recharge the battery pack before using.
If the battery pack is charged fully but not used for a long time (about 1 year), it becomes discharged. Charge it again but in this case the battery life will be shortened than normal. After several charging and discharging cycles, the battery life will recover its original capacity.

Keep the Terminals Clean

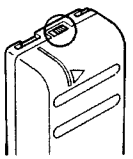
If the terminals (metal parts on the back) are not clean, the battery duration will be shortened.
When the terminals are not clean or when the battery pack has not been used for a long time, install and remove the battery pack from time to time. This will improve the contact condition. Also, wipe the + and – terminals with a soft cloth or paper.

Notes on the Rechargeable Battery Pack

Why the battery pack heats up
During charging or recording, the battery pack heats up. This means energy has been generated and chemical change has occurred inside the battery pack and this is not dangerous.

How to care for the battery pack
- Remove the battery pack from the camcorder after using it, and keep it in a cool place. When the battery pack is attached to the camcorder, a small amount of current flows to the camcorder even if the POWER switch is turned off. It causes overdischarging and shortens battery life.
- The battery pack is always discharging even when it is not in use after charging. Thus it is recommended you charge the battery before using.

(C-6)

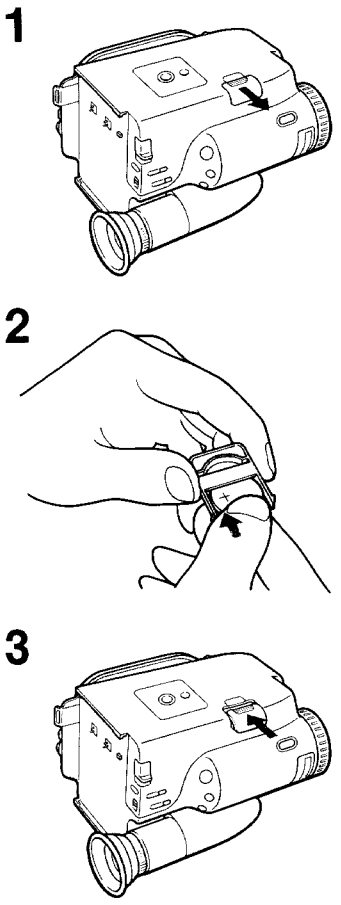


How to use the switch on the battery pack (C-6)
This switch is provided so that you can remember the charging condition. Set the switch to the "no mark" position when charging is completed. Set the switch to the "red mark" position when the battery is used up.

How many times can the battery pack be recharged
It can be fully charged and discharged about 500 times under normal temperatures. If the ⏍ mark blinks rapidly just after turning on the camcorder with a fully charged battery pack, the battery pack should be replaced with a new fully charged one.

Temperatures during charging
Lower temperatures require a longer charging time. Charging under temperatures ranging from 10° C to 30° C (50°F to 86°F) is recommended.

(D-1)



Inserting the Lithium Battery

(D-1)

This camcorder uses a lithium battery to activate the clock and to keep a title in memory. Before operating it for the first time, install the supplied lithium battery.

1 Pull out the lithium battery holder from the bottom of the camcorder.

2 Install the supplied CR2025 lithium battery with the + side facing the other side.

3 Put the lithium battery holder back into the camcorder.

To change the lithium battery

Pull out the lithium battery holder from the camcorder, and remove the lithium battery and insert a new one.

Note on battery life

The battery lasts for approximately 1 year under normal operation. When the lithium battery becomes weak, the time indication blinks in the viewfinder for about 5 seconds when POWER is set to CAMERA. **When this happens, replace the battery with a Sony CR2025 or Duracell DL-2025 lithium battery. Use of another battery may present a risk of fire or explosion.** While replacing the lithium battery, keep the battery pack or other power source attached. If the battery pack or other power source was not attached while replacing, readjustment of the date and time is necessary.

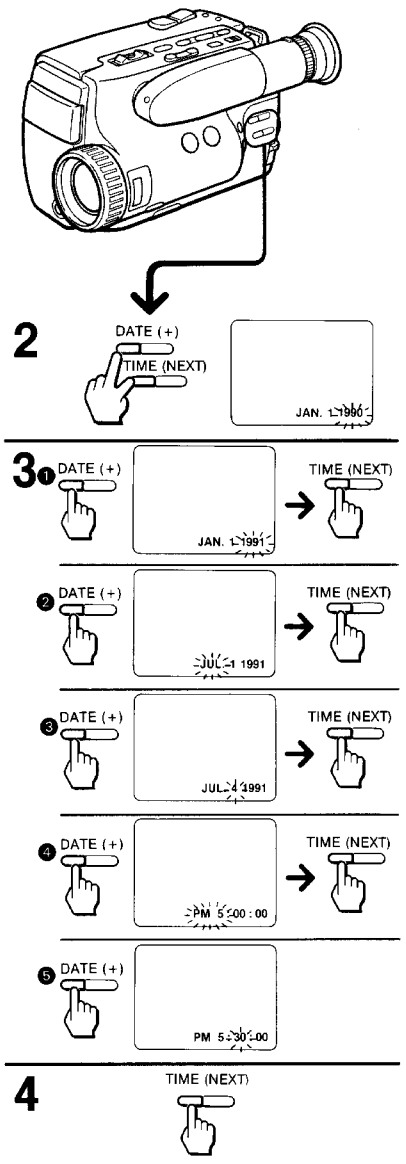
Cautions

- Keep the lithium battery out of the reach of children. Should the battery be swallowed, consult a doctor immediately.
- Wipe the battery with a dry cloth to assure good contact.
- Be sure to install the battery with the correct polarity.
- Do not hold the battery with metallic tweezers, as a short-circuit may occur.

WARNING

Battery may explode if mistreated. Do not recharge, disassemble, or dispose of it in a fire.

(D-2)



Setting the Date and Time

(D-2)

1 **Make sure that a power source is connected, set POWER to CAMERA, and turn STANDBY to STANDBY.**

2 **Press DATE and TIME simultaneously for more than 3 seconds until the date indication appears in the viewfinder.**
DATE now functions as + (to advance numbers) and TIME functions as NEXT (to execute).

3 **Set the year, month, day, hour and minute, in that order.**
First adjust the blinking digits with + and then press NEXT.

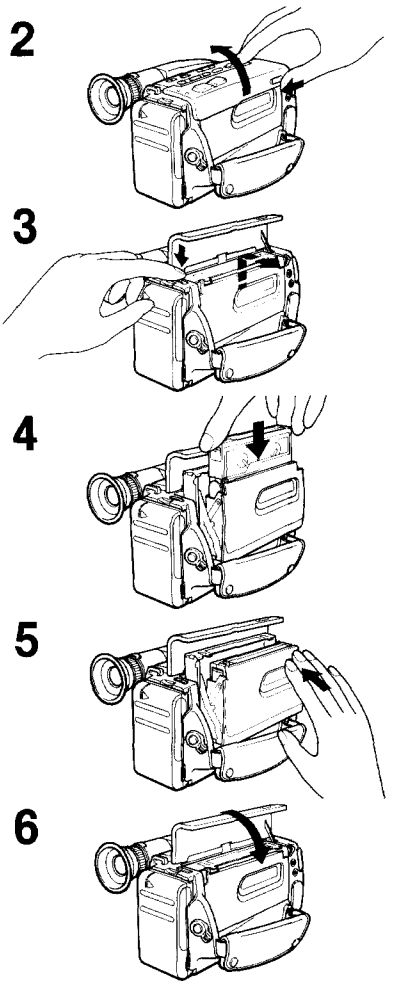
4 **Press NEXT to set the second.**
The clock starts operating.

To correct the date and time setting
Repeat steps **2** to **4**.

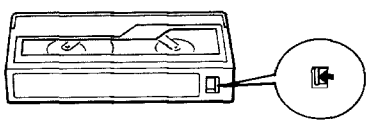
To advance the digits faster
Keep + pressed.

To check the preset date and time
Press DATE or TIME. When you press the same button again, the indication goes out.

(E-1)



(E-2)



Inserting a Tape

(E-1)

1 ***Make sure a power source is connected.***

2 **While sliding the lid lock in the direction of the arrow, lift up the lid fully.**

3 **Press EJECT.**
The lip of the cassette compartment will automatically lift up and open toward you.

4 **Insert the tape with the window facing out.**

5 **Press the PUSH mark on the cassette compartment cover to close it.**

6 **Close the lid.**

Ejecting the Tape

1 Make sure that a power source is connected.
2 While sliding the lid lock in the direction of the arrow, lift the lid up fully.
3 Press EJECT.
The lip of the cassette compartment will lift up and automatically open toward you.
4 Take out the tape and press the PUSH mark on the comparment to close it.
5 Close the lid.

Preventing Accidental Erasure

(E-2)

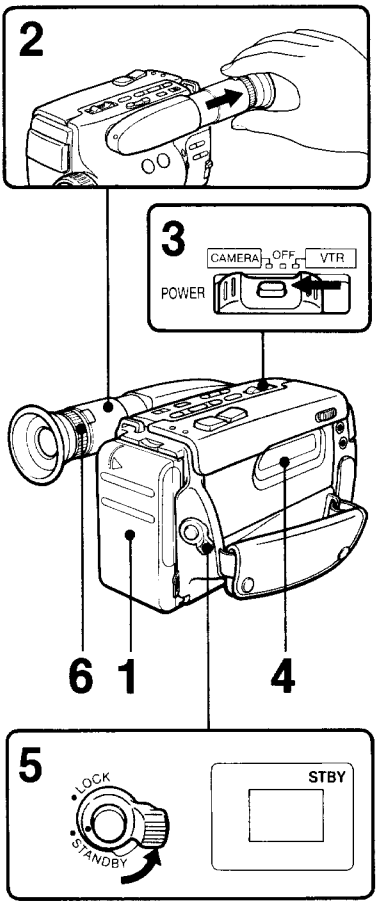
Slide out the red tab on the tape to protect the recording.
To re-record on this tape, slide the tab back in.

Notes on handling tapes

- Never insert anything in the small holes on the rear of the tape. These holes are used to sense the type of tape, thickness of tape, or if the tab is out or in, etc.
- Store tapes in their cases and keep them in an upright position to prevent intrusion of dust and uneven winding.

Adjusting the Viewfinder Lens

(F)



The position of the viewfinder lens for optimum vision varies depending on the person. Adjust when using the first time, or when using after someone else. **(F)**

1 **Make sure a power source is connected.**

2 **Pull the viewfinder out until it clicks.**

3 **While pressing the green button, set POWER to CAMERA.**

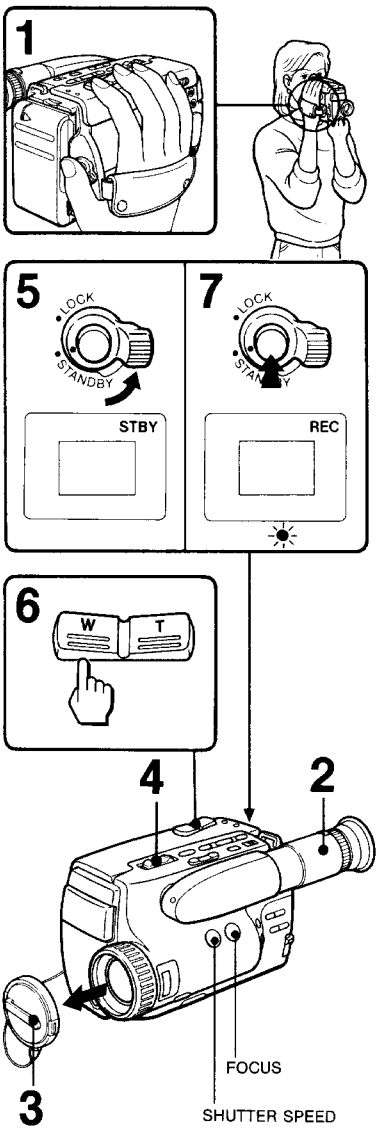
4 **Insert a tape.**

5 **Turn STANDBY to STANDBY.**

6 **Turn the viewfinder lens adjustment ring so that the "STBY" display in the viewfinder comes into sharp focus.**

Recording a Picture Using Automatic Adjustments

(G-1)



Before recording "once-only" events, we strongly recommend making a trial recording and checking that everything is working properly.

(G-1)

1 **Hold the camcorder as illustrated.**
Put your hand through the grip strap and check that your thumb can easily touch START/STOP.

2 **Make sure that the viewfinder is pulled out.**

3 **Remove the lens cap.**

4 **While pressing the green button, set POWER to CAMERA.**

5 **Turn STANDBY to STANDBY.**
"STBY" and the autofocus frame appear in the viewfinder.
If the autofocus frame does not appear, press FOCUS.
If the shutter speed indication appears in the viewfinder, press SHUTTER SPEED repeatedly until it goes out.
The camcorder is now in the standby mode, and focus is adjusted automatically inside the frame (autofocus adjusting range). Do not turn or stop the focus ring forcibly.

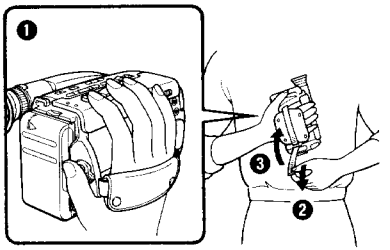
6 **Keep the W side of the power zoom button pressed.**

7 **Press START/STOP.**
"REC" appears and the red lamp lights up in the viewfinder. The camcorder is now recording.

To pause (to stop momentarily)
Press START/STOP again.
"STBY" appears in the viewfinder. The camcorder is in the standby mode again.

To stop
Turn STANDBY to LOCK and set POWER to OFF.

(G-2)



How to fit the grip strap (G-2)
In step 1 on the previous page, hold the camcorder against your body (❶) and pull the grip strap upward (❷, ❸).

For low-position recording (G-3)
The viewfinder can be turned 90 degrees up. It can be used in either the pushed-down or pulled-out position.

(G-3)

Notes on recording
- To record from the beginning of the tape, run the tape for about 15 seconds before recording. This will avoid missing the starting point when the tape is played back.
- If POWER is moved during recording, the tape will stop.
- When moving from indoors to outdoors, or vice versa, turn STANDBY to STANDBY and point the camcorder at a white object for about 10 seconds so that the tone of colors is properly adjusted.

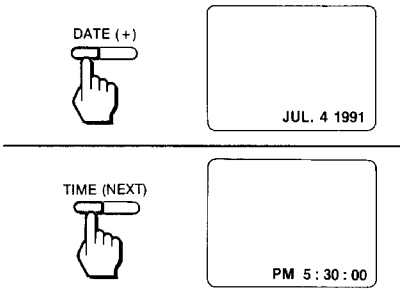
Note on the standby mode
If you leave the camcorder in the standby mode for 5 minutes or more, the camcorder will be turned off automatically. To resume the standby mode, Turn STANDBY to LOCK once and turn it to STANDBY again. To start recording, press START/STOP directly.

Note on light sources
If you are shooting a subject under bright conditions just after shooting in a dark place, the picture may not appear in the viewfinder. In this case, point the camcorder in another direction.

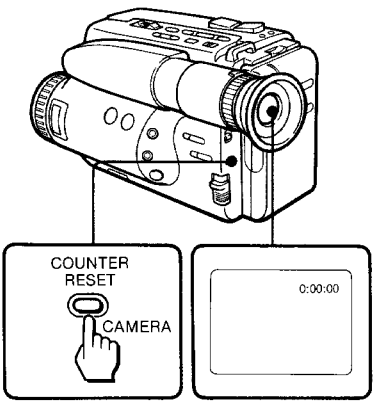
Recording mode
This camcorder records in the SP (standard play) mode and can play back in the SP and the LP (long play) modes.
The quality of the playback picture in the LP mode, however, will not be as good as that in the SP mode.

Note on PCM recording and playback
PCM recording or playback is not possible with this camcorder.
The PCM sound recorded or after-recorded with another video recorder cannot be played back with this camcorder.

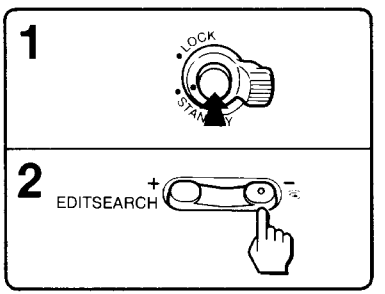
(G-4)



(G-5)



(G-6)



To Record Date or Time

(G-4)

During camera recording or when in the recording pause mode, press DATE for date indication or TIME for time indication.
The date or time displayed in the viewfinder is recorded with the picture.

To stop recording date or time
Press DATE or TIME again.
The picture recording continues.

To Use the Tape Counter (for Camera Recording)

(G-5)

During recording, the digits on the counter in the viewfinder indicate the actual recording time. To return to the counter "0:00:00" point, press COUNTER RESET (CAMERA).

Notes on the tape counter
- The counter does not operate during playback.
- The counter reading and the actual time may not correspond exactly. Use the counter as a guide.

To Check the Last Portion of the Previous Recording

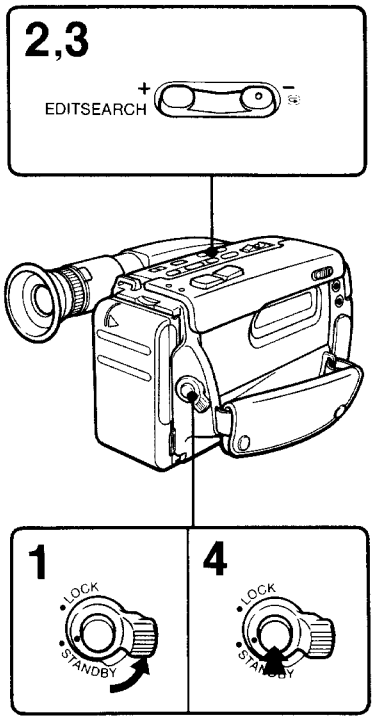
(G-6)

1 **Set the camcorder in the recording pause mode by pressing START/STOP.**

2 **Press − side of EDITSEARCH (⏪) momentarily.**
The last few seconds of the recorded portion are rewound and then the recorded picture appears in the viewfinder. After a few seconds of playback, the camcorder goes back to the recording pause mode.

If the picture has not been recorded
The video heads may be contaminated. Clean the heads using the Sony V8-25CLH video head cleaning cassette or equivalent.

(G-7)



To Re-record a Previously Recorded Portion

(G-7)

1 **Turn STANDBY to STANDBY to set the camcorder to the standby mode.**

2 **Look in the viewfinder and find the point from where you want to begin the recording by:**
Keeping the + side of EDITSEARCH pressed to advance the picture at the normal playback speed, or the – side to reverse the picture.

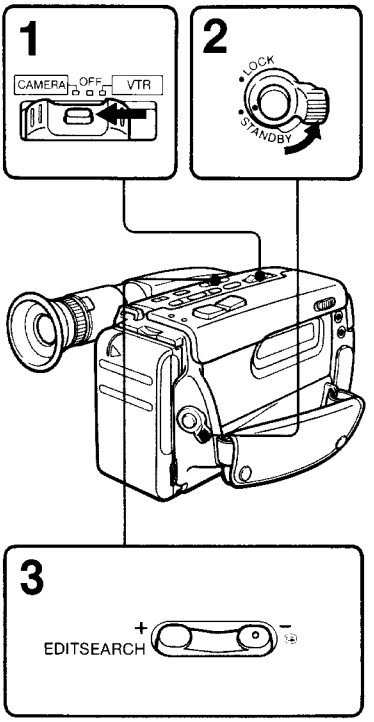
3 **At the desired point, release EDITSEARCH.**

4 **Press START/STOP to start recording.**

The picture is connected smoothly after the prerecorded portion even if STANDBY is turned up and down, or even if the power is turned off and on again, provided that the tape is not removed.

To stop
Turn STANDBY to LOCK.

(G-8)



Playing Back the Picture Instantly

(G-8)

You can check the recorded picture in the viewfinder. Sound is not heard.

1 While pressing the green button, set POWER to CAMERA.

2 Turn STANDBY to STANDBY.

3 Keep pressing the + or – side of EDITSEARCH to play back the picture.

+ side: to view the playback picture

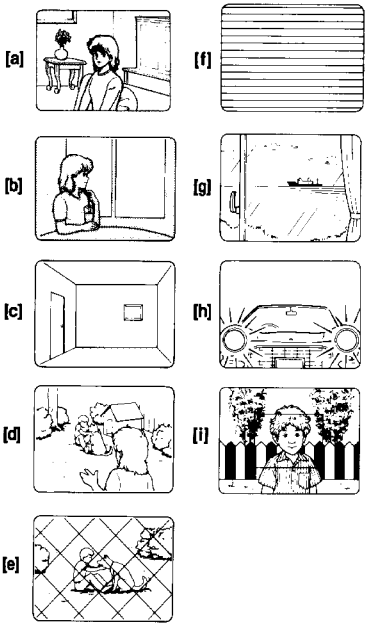
– side: to view the playback picture in reverse

To stop playback

Release EDITSEARCH.

Manual Focusing

(H-1)



Using the autofocusing, you can easily get a focused picture under most shooting conditions. But manual focusing is recommended in the following cases.

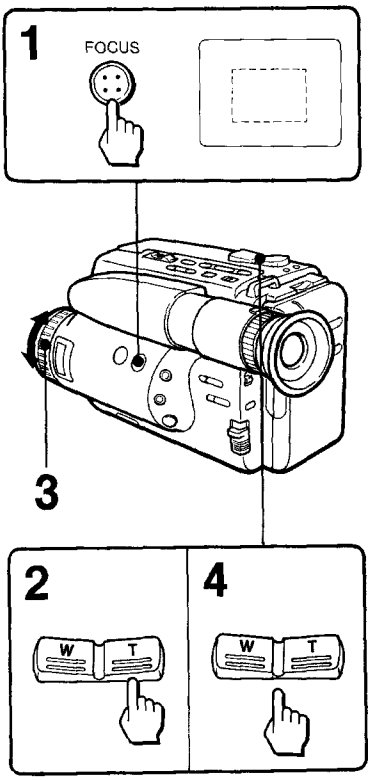
[a] to **[i]** correspond to the illustrations. **(H-1)**

[a] Insufficient light
[b] Too much brightness behind the subject
[c] Subject with little contrast — wall, sky, etc.
[d] One subject is close; the other is in the center, but at a distance
[e] Subjects beyond nets, etc., or another subject passes in front of the camcorder
[f] Horizontal stripes
[g] Subject through frosted glass
[h] Bright subject or subject reflecting light
[i] High contrast behind the subject (the background may be focused)
[j] Under the following circumstances
- When using conversion lenses of effect filters
- When shooting a stationary subject using a tripod
- To save battery wear

Autofocusing does not function momentarily when:
- The setting of the shutter speed is changed.
- Backlight is adjusted manually.
- Lighting conditions change quickly.
- Zooming is done from wide-range to telephoto.

This camcorder keeps in focus by referring to the picture contrast, which is weak in the above situations.

(H-2)



Focusing Manually

(H-2)

1 Press FOCUS.
Make sure that the autofocus frame in the viewfinder goes out.

2 Keep the T side of the power zoom button fully depressed to telephoto.

3 Turn the focus ring to achieve sharp focus.

4 Set the desired shot length using the power zoom button.
Keep the button pressed lightly to change the shot length slowly. Keep it fully depressed to change the shot length rapidly.

Some helpful hints

- When shooting in relatively dark places such as indoors, the depth of field in proper focus is very shallow. For best results, shoot at wide angles after focusing in telephoto.
- When shooting a scene with lots of movement in bright light, keep the W side of the power zoom button pressed for wide-angle and set the focus ring to 2 m.

Setting the Shutter Speed

(I-1)

When a fast-moving subject is recorded at normal shutter speed, it may not be seen clearly when played back in the pause mode (still picture). This can be improved by increasing the shutter speed. The shutter speed, 1/60 (normal speed), 1/100, 1/1000 or 1/4000 of a second can be selected. **(I-1)**

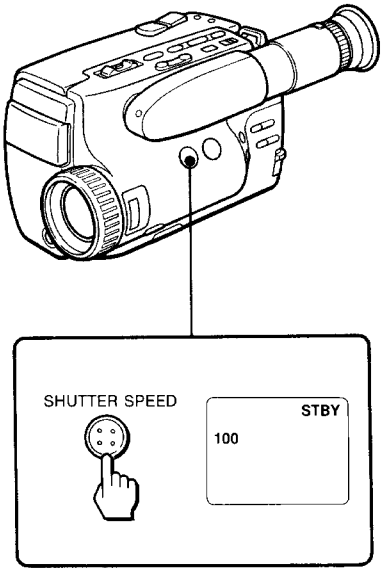
When recording at a high-speed shutter setting, record in a brighter place than usual.
Also, the depth of field in proper focus becomes shallow at a higher shutter speed. This is effective to record the main subject in sharp focus and the surroundings out of focus.

Recommended setting for your situation
Choose an appropriate shutter speed according to the situation, referring to the chart for examples.

Example use	Recommended shutter speed
• On clear days recording a golf or tennis swing (To view the hit ball clearly in the still picture mode) • Recording skiers	1/4000
• On overcast day recording a moving merry-go-round or roller coaster	1/1000
• Instead of the ND2 filter (To reduce the exposure level to about a half) • Recording indoor sports (for stable shooting)	1/100

When playing back the picture recorded at certain speeds
Use 8mm video equipment with the clean still function to obtain a noiseless still picture.

(I-2)



Selecting the Shutter Speed

(I-2)

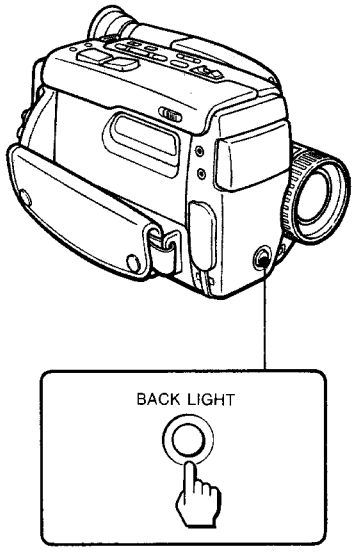
Press SHUTTER SPEED repeatedly until the desired shutter speed indication appears.
Each time you press the button, the indication changes as follows.

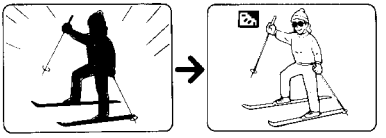
No indication (1/60) → 100 (1/100) → 1000 (1/1000)
↑ ← 4000 (1/4000) ←

Notes

- When you select a shutter speed 1/1000, record under sunlight or use a video light.
- When you record a TV screen with certain shutter speeds, the brightness of the recorded picture may vary.
- When you shoot a very bright subject at a faster shutter speed, a light vertical, belt-like line (smear) may appear on the screen.
- When you record at certain shutter speeds under a light discharges tube, such as a fluorescent lamp, sodium lamp, or mercury lamp, the brightness of the recorded picture may vary (causing the picture to flicker).

(J)





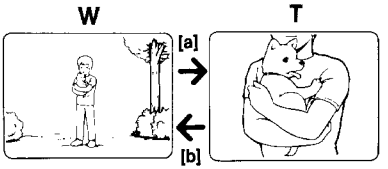
Shooting with Backlighting

In this camcorder, the exposure is automatically controlled. However, when shooting a subject that is backlit, that is, if the light source is behind the subject, use BACK LIGHT. **(J)**

Press BACK LIGHT.
The indication appears.

After shooting
Be sure to release this adjustment setting by pressing BACK LIGHT again. (The indication goes out.)
Otherwise, the recorded picture will be too bright.

(K-1)



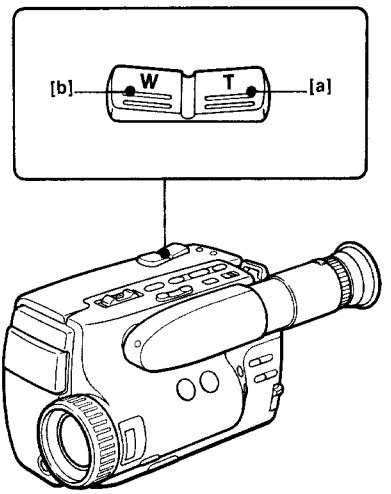
The size of the subject in the screen can be changed. Use "zoom-in" for dramatic close-ups **[a]**. Use "zoom-out" for panoramic long shots **[b]**. Also use zooming to focus manually or to decide the shooting angle. Rapid zooming can be effected by keeping the power zoom button fully depressed. **(K-1)**

Smooth and Constant Zooming

(K-2)

Keep the T side of the power zoom button lightly pressed for telephoto (subject appears closer) **[a]** and the W side for wide-angle (subject appears farther away) **[b]**.

(K-2)



Rapid Zooming — To Create a Dramatic Effect

(K-2)

Keep the T side of the power zoom button fully depressed for telephoto **[a]** and the W side for wide-angle **[b]**.

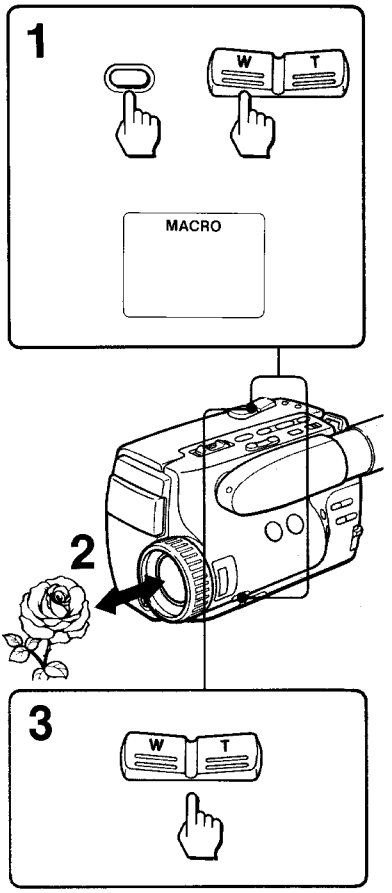
Focal length of this camcorder
The focal length is 7 mm to 42 mm (9/32 to 1 11/16 inches). This means approximately 50 mm to 300 mm (2 to 11 7/8 inches) when converted into the focal length of a 35-mm camera.

For more zooming effect
Use the Sony VCL-0637 or VCL-1437 conversion lens (not supplied). If you use a 46 mm conversion lens, attach it using the supplied step-up-ring. Auto focus, however will not function in that case.

When shooting with autofocusing
When you press the power zoom button for wide-angle, the focus ring will be fixed around the 2m position and may not exactly match the actual object-to-camera distance.

Close-Up (Macro)

(L)



Even small subjects, such as flowers, insects, and photographs, can literally fill the screen.
(L)

1 **Keep the W side of the power zoom button fully depressed, pressing MACRO.**
The MACRO indication appears in the viewfinder.

2 **Bring the camcorder as close as necessary to obtain the desired size of image.**
The subject can be as close as a minimum of 10 mm (7/16 inch) from the lens surface.

3 **Keep the power zoom button pressed lightly to focus sharply while the MACRO indication is displayed.**

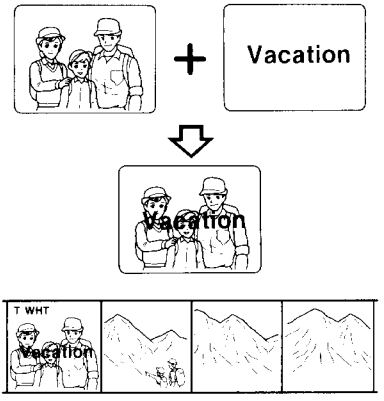
In the MACRO range, autofocusing does not function.

Notes

- When shooting in macro, the depth of field is very shallow. So pay attention to focusing. To keep the subject in focus, use a tripod.
- If the subject is closer than 10 mm (7/16 inch), it cannot be brought into focus.

Recording a Title

(M-1)



You can superimpose your own hand-lettered message or illustration over the picture during recording or playback (editing). **(M-1)**

- One title can be stored.
- The color of the title can be selected from 8 colors.

To make a desired title card, use a plain, white card and write a title using a dark color and thick lines.

Before recording, store the title or illustration.

Storing a Title

(M-2)

Make sure that the lithium battery is installed.

1 While pressing the green button, set POWER to CAMERA.

2 Turn STANDBY to STANDBY to set the camcorder in the standby mode.

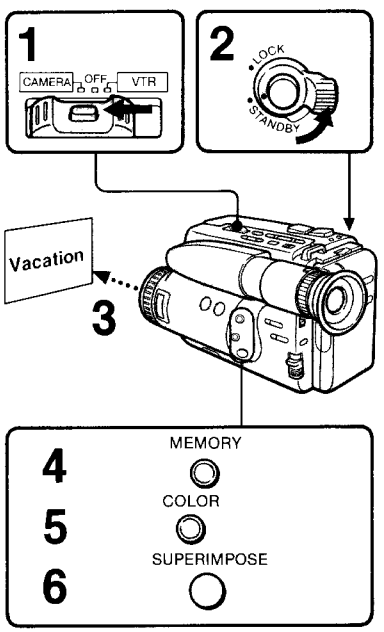
3 Point the camcorder to the title card and adjust the focus.
To focus the subject, use the close-up function.

4 Press MEMORY to store the title.

5 Press COLOR to select the title color.
Each time you press the button the indication changes as follows.
WHT(white) → BLUE → GRN(green) → CYAN
↑ ↓
BLK(black) ← YEL(yellow) ← VIO(violet) ← RED

6 Press SUPERIMPOSE to turn off the title.

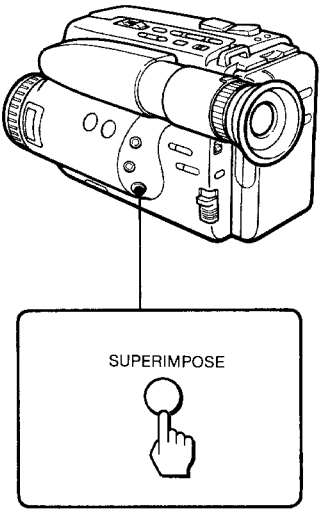
(M-2)



To check the title
Press SUPERIMPOSE in the standby mode. To turn off the title, press the button again.

About memory back-up
The camcorder uses a lithium battery (located on the bottom of the unit) to keep the title in memory. The battery life is approximately 1 year under normal operation.

(M-3)



Superimposing the Title on a Picture

(M-3)

1 During recording, press SUPERIMPOSE at the point from which you want to insert the title.
The title appears. During recording, the title is recorded.

2 Wait for a while and press SUPERIMPOSE again.
The title goes out.

When recording the title at the beginning
We recommend the following method:
1 Set the camcorder in the standby mode.
2 Press SUPERIMPOSE.
The title appears.
3 Press START/STOP.
The title is recorded.
4 Wait for a while and press SUPERIMPOSE again.
The title goes out.

About the color indication
- The color indication in the viewfinder is not recorded.
- You can change the title color by pressing COLOR even after displaying the title.

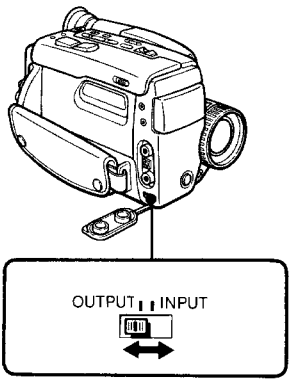
Connections for Playback

To view the playback picture on the TV screen, the camcorder and the TV and/or VCR must be connected properly. Check the following connecting examples and go to the appropriate section to make the connections required. We recommend use of the AC power adaptor as a power source.

Types of Connections

Type 1: Connecting the camcorder to a TV without video/audio input jacks.
Type 2: Connecting the camcorder to a TV with video/audio input jacks.
Type 3: Connecting the camcorder to a TV via a VCR that has an input selector.

(N-1)



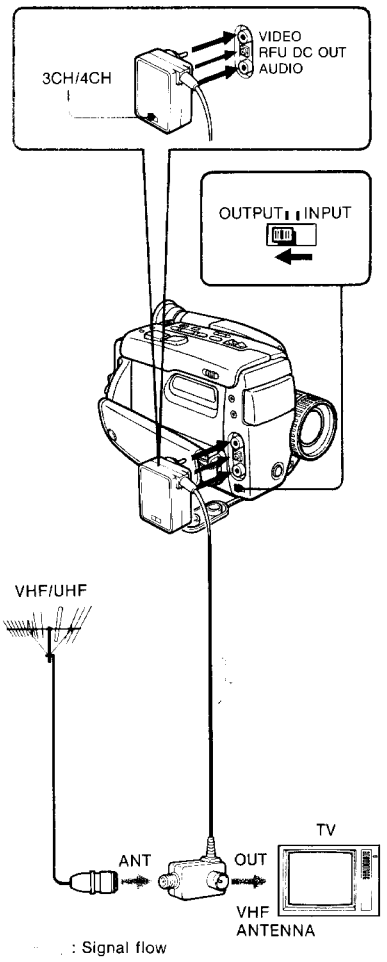
About the AUDIO/VIDEO Jacks

(N-1)

The AUDIO/VIDEO jacks work as both input jacks and output jacks. Set the INPUT/OUTPUT selector as follows.

OUTPUT position	to view playback tape
INPUT position	to record from TV or another tape

(N-2)



Type 1: Connecting to a TV without Video/Audio Input Jacks

(N-2)

Step 1

Connecting the camcorder, the RFU adaptor (RFU-90UC, supplied), and the TV.

1 Connect the RFU adaptor to the camcorder.

2 Connect the RFU adaptor to the VHF/UHF antenna and to the TV.

3 Set the INPUT/OUTPUT selector on the camcorder to OUTPUT.

Step 2

Selection of the TV channel to monitor the camcorder playback.

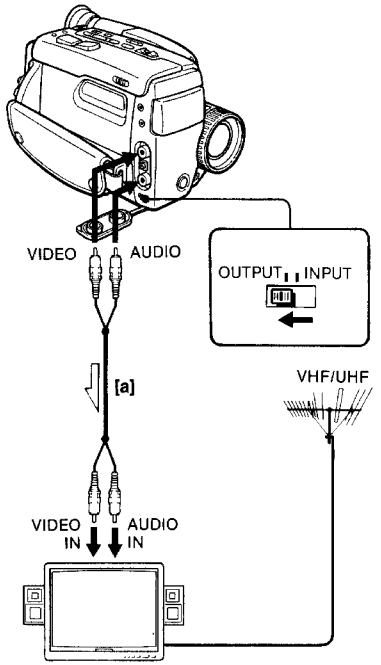
1 Set the RF unit selector on the RFU adaptor to either 3CH or 4CH, whichever is not active in your area.

2 Select the same channel on the TV.

Step 3

Whenever playing back a tape, be sure to set the TV to the channel that you have selected in step 2.

(N-3)



: Signal flow

Type 2: Connecting to a TV with Video/ Audio Input Jacks

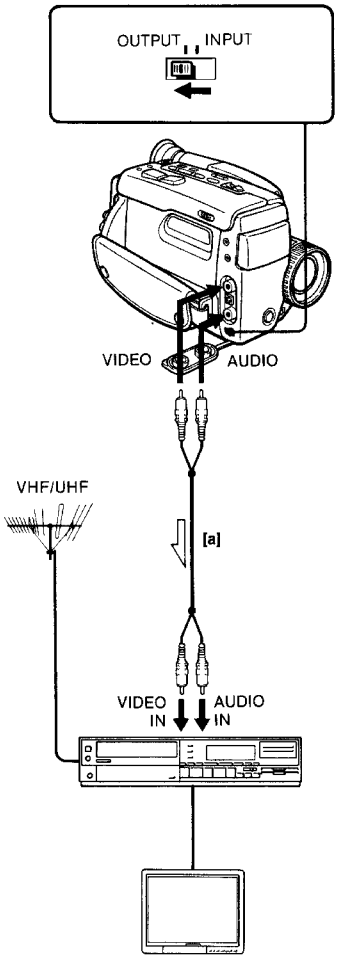
(N-3)

1 **Connect the camcorder to the TV.**
Use an appropriate audio/video connecting cable according to the connector type of your TV.
Sony offers you the following cables.
[a] VMC-710M/720M: for monaural TV
[b] VMC-910MS/920MS: for stereo TV

2 **Set the INPUT/OUTPUT selector on the camcorder to OUTPUT.**

3 **Set the TV/VTR selector on the TV to VTR.**

(N-4)



Type 3: Connection to a TV via a VCR with an Input Selector

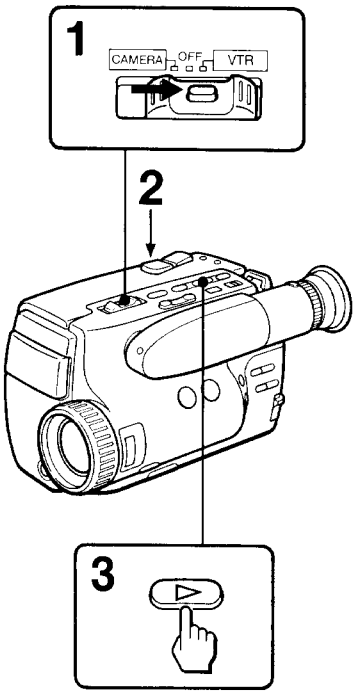
(N-4)

1 **Make connections using an appropriate audio/video connecting cable according to the connector type of your VCR.**
Sony offers you the following cables.
[a] VMC-710M/720M: for monaural VCR
[b] VMC-910MS/920MS: for stereo VCR

2 **Set the INPUT/OUTPUT selector on the camcorder to OUTPUT.**

3 **Set the input selector on the VCR to LINE and set the TV/VTR selector on the TV to VTR.**

(O)



Turn on the TV, and select the channel for viewing a playback picture (or set the TV/VTR selector to VTR when a TV has video/audio input jacks). **(O)**

1 While pressing the green button, set POWER to VTR.

2 Insert a tape.

3 Press ▷.
Playback starts.

To view a still picture
Press ❚❚ during playback.
To resume playback, press ❚❚ or ▷ again.

To stop playback
Press □.

To rewind the tape
Press ◀◀.

To advance the tape rapidly
Press ▶▶.

Note
Streaks will appear and sound will be muted in the still picture mode.

Monitoring a High-Speed Picture

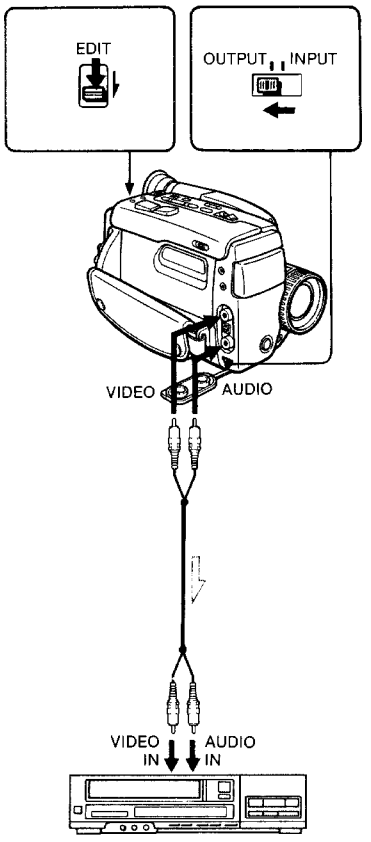
During playback — Picture search
1 In the playback mode, press ◀◀ or ▶▶.
The picture will be monitored at high speed as long as ◀◀ or ▶▶ is kept pressed.
2 Release ◀◀ or ▶▶ at the desired point.
Normal playback will resume.

During fast-forward or rewind — Skip scan
1 In the fast-forward or rewind mode, press ◀◀ or ▶▶.
The picture is monitored as long as ◀◀ or ▶▶ is kept pressed.
2 Release ◀◀ or ▶▶ to resume the normal fast-forward or rewind mode.

Notes
- If you move the position of POWER during playback, the tape will stop. When you move POWER to CAMERA in the playback pause mode, however, the camcorder will enter recording pause mode.
- When the pause mode lasts for 5 minutes or more, the camcorder will automatically enter the stop mode.

Editing onto Another VCR

(P)



: Signal flow

You can create your own video program by editing with any other 8 8 mm, β Betamax or VHS VHS VCR.

Before You Begin

- Make connections using an appropriate audio/video connecting cable according to the connector type of your VCR. **(P)**
  Sony offers you the following cables.
  [a] VMC-710M/720M: for monaural VCR
  [b] VMC-910MS/920MS: for stereo VCR
- Set the input selector of the VCR to LINE, if available.

Operation

1 Insert a tape to be recorded into the recording VCR.
2 Move EDIT on the camcorder in the direction of the arrow. (EDIT ON)
3 Set INPUT/OUTPUT to OUTPUT.
4 Set POWER of the camcorder to VTR and insert your recorded tape.
5 Play back the tape on the camcorder and locate the point where you want to start editing and set the camcorder to the playback pause mode.
6 On the recording VCR, locate the recording start point and set the VCR to the recording pause mode.
7 Press II on both units simultaneously to start editing.

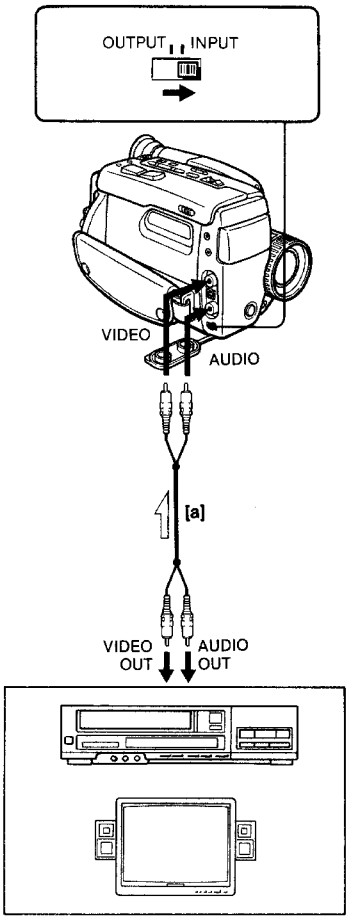
To stop editing momentarily
Press II on the recording VCR.

To edit more scenes
Repeat steps **5** to **7**.

To stop editing
Press □ on both units.

Use of the EDIT switch
When you set EDIT to the direction of the arrow (EDIT ON), picture and sound deteriorations resulting from editing can be kept to the minimum. Avoid using the edited tape for multiple generations of editing. After editing, move EDIT in the opposite direction of the arrow (EDIT OFF).

(Q)



: Signal flow

Recording from Another VCR or TV

You can record a tape from another VCR or a TV program from the TV equipped with audio/video outputs. **(Q)**

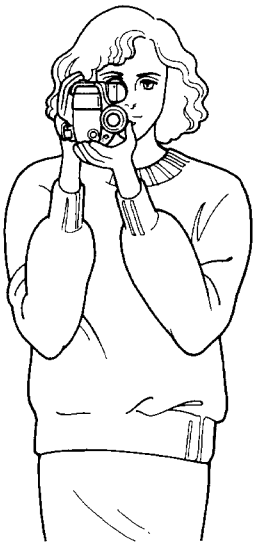
Before You Begin

- Disconnect the RFU adaptor from the camcorder if it is connected.
- Make connections using an appropriate audio/video connecting cable according to the connector type of your VCR or TV. Sony offers you the following cables.
  [a] VMC-710M/720M: for monaural VCR or TV
  [b] VMC-910MS/920MS: for stereo VCR or TV
- Read the instruction manual of the other equipment to be connected.

Operation

1 Turn on the TV or VCR.
2 Select the TV program or play back the tape to be recorded.
3 Set INPUT/OUTPUT to INPUT.
4 While pressing the green button, set POWER on the camcorder to VTR.
5 Insert a tape and slide ● REC.
Recording starts.
You can monitor the picture being recorded in the viewfinder.

(R-1)



Shooting Stable Pictures

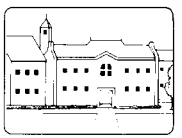
Assume a good posture for shooting (R-1)
For hand-held shots, it is important to hold the camcorder properly.

- Hold the camcorder firmly and secure it with the grip strap so that you can easily manipulate the camcorder with your thumb.
- Place your right elbow against your side.
- Place your left hand under the camcorder to support it. When adjusting the focus manually, make sure the camcorder does not move.
- Place your eye firmly against the viewfinder eyecup.

Use a tripod
If you have a tripod for a still camera, it can also be used with the camcorder. If a tripod is not available, try placing the camcorder on a table top or any other flat surface of suitable height.

Keep the horizontal plane level (R-2)
The horizontal plane can be easily determined by using the viewfinder frame as a reference.

(R-2)



Planning Beforehand

If you are going to edit the tape after recording
Shoot the scene a little longer to make the editing easier.

If you are not going to edit the tape after recording
First record a title and then use the START/STOP button to make a smooth recording.

Lighting

Shoot with the sun behind you

When the light source is behind the subject, or in the following situations, the subject will be recorded too dark and the background too light.

- The subject is indoors and there is a window behind the subject.
- Bright source such as fluorescent or incandescent lamps are included in the scene.
- You are shooting a person wearing white or shiny clothes in front of a white background. In this case, the face will be recorded too dark.

Use video light in the dark

To get the best colors, a sufficient light level must be maintained. Photography lamps or halogen lamps are recommended. For best result, use of Sony video lights are recommended because of their weight and low heat output levels. When using a video light, attach it to the camcorder with the video light attachment (not supplied.)

Do not point the light at the camcorder. The high heat from the light can wrap the casing of the camcorder.

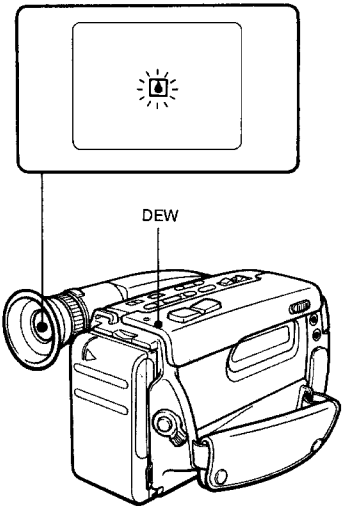
For detailed instructions on proper use of the light, read its instruction manual.

Brightness levels

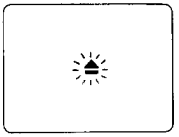
Using the following chart as a reference, take a few minutes to familiarize yourself with brightness levels to improve your recording technique.

	Unit: lux	ND filter recommended
Snow-covered mountains Snow fields Sandy beach, clear day in summer		
Clear day, mid-day (100,000lux)	100,000	
Clear day, mid-afternoon (35,000) Overcast day, mid-day (32,000)	10,000	
Overcast day, one hour after sunrise (2,000) Office lit by fluorescent lamps, near window (1,000) Clear day, one hour before sunset (1,000) Department store counter (500–700) Station wicket (650) Office lit by fluorescent lamps (400–500)	500	normal recording
Room lit by two 30 W fluorescent lamps (300)	300	
Subway station platform (300) Arcade at night (150–200)	200	
Theater lobby (15–35)	100	video light recommended
Candle light (10–15)	10	

(S-1)



(S-2)



Notes on Moisture Condensation

If the camcorder is brought directly from a cold place to a warm place, moisture may condense inside the camcorder, on the surface of the tape, or on the lens. In this condition, the tape may stick to the head drum and be damaged or the camcorder may not operate correctly. To prevent possible damage under these circumstances, the camcorder is furnished with moisture sensors. However, take the following precautions.

If moisture condenses inside the unit

(S-1)

Moisture is present inside the camcorder when the 💧 indication in the viewfinder blinks. ⏏ indication also blinks when the tape is inserted. In this case, no function except for tape ejection will work.
Eject the tape, turn off the camcorder, and leave it with the cassette compartment open for at least 1 hour.
The camcorder can be used again if the 💧 indication does not appear when the power is turned on again.

If moisture condenses on the surface of the tape

(S-2)

If moisture is present on the surface of the tape when the tape is inserted and a tape transport button (▷, ▶▶, etc.) is pressed, the ⏏ indication blinks inside the viewfinder. In such case, no function except for tape ejection will work.
Eject the tape and let it sit for at least 1 hour.
The tape can be used again if the ⏏ indication does not appear when the tape is inserted and a tape transport button is pressed.

If moisture condenses on the lens

No indications will appear, but the picture becomes dim.
Turn off the power and leave the camcorder unused for at least 1 hour.

(S-3)

Notes on Video Head Cleaning

To ensure clear picture, clean the video heads periodically.

When playback pictures are noisy or hardly visible, the video heads may be contaminated. **(S-3)**

[a] Slight contamination
[b] Critical contamination

In such cases,

1 Clean the video heads with the Sony V8-25CLH cleaning cassette(not supplied), referring to its instructions.
2 After cleaning, check if the picture is clear by recording or playing back with an ordinary tape.
3 If the picture is still noisy, repeat cleaning. (Do not repeat cleaning more than 5 times.)

Caution

Do not use a commercially available wet-type cleaning cassette. It may damage the video heads.

Note

If the V8-25CLH cleaning cassette is not available in your area, consult your Sony service facility.

Precautions

On operation

- Operate the camcorder on 6.0 V (battery pack), 7.5 V (AC power adaptor), 9.0 V (alkaline batteries).
- For DC or AC operation, use the accessories recommended in this manual.
- Should any solid object or liquid fall into the casing, unplug the camcorder and leave it checked by qualified personnel before operating it any further.
- Do not hold the camcorder by the viewfinder.
- Avoid rough handling or mechanical shock. Be particularly careful of the lens.
- Keep the lens cap on the lens when not using the camera.
- Do not wrap the camcorder and operate it because heat may built up internally.
- Keep the camcorder away from strong magnetic field or mechanical vibration.
- Do not put the camcorder on the sand.

On care

- When the unit will not be used for a long time, disconnect the power source and remove the tape. Periodically turn on the power, operate the camera section and player section, and play back a tape for about 3 minutes.
- Clean the lens with a soft brush to remove dust. If there are fingerprints on it, wipe them off with a soft cloth.
  Clean the camcorder body with a dry, soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.

Note on copyright
Television programs, films, video tapes, and other materials may be copyrighted. Unauthorized recording of such materials may be contrary to the provision of the copyright laws.

Each country has its own electricity system and TV color system. Before using your camcorder abroad, check the following points.

Power Sources

You can use your camcorder in any country with the supplied AC power adaptor within 100 V to 240 V AC, 50/60Hz.

Difference in Color Systems

You can view the playback picture in the viewfinder. However, if you want to view the playback picture on a TV, it must be a NTSC system-based TV. Check the following list. (in alphabetical order)

NTSC system countries
Bahama Islands, Bolivia, Canada, Central America, Chile, Colombia, Ecuador, Jamaica, Japan, Korea, Mexico, Peru, Surinam, Taiwan, The Philippines, U.S.A., Venezuela, etc.

PAL system countries
Argentina, Australia, Austria, Belgium, Brazil, China, Denmark, Finland, Great Britain, Holland, Hong Kong, Italy, Kuwait, New Zealand, Norway, Paraguay, Portugal, Singapore, Spain, Sweden, Switzerland, Thailand, Urguay, West Germany, etc.

SECAM system countries
Bulgaria, France, Guiana, Hungary, Iran, Iraq, Monaco, Poland, Soviet Union, etc.

Specifications

System

Video recording system	Four Rotary heads, Helical scanning FM system
Audio recording system	Rotary head, FM system
Video signal	NTSC color, EIA standards
Usable cassette	8 mm video format cassette
Tape speed	SP mode: Approx. 1.43 cm (1/16 inch)/sec LP mode: Approx. 0.72 cm (1/32 inch)/sec playback only
Recording time	SP mode: 2 hours (P6 – 120)
Playback time	SP mode: 2 hours (P6 – 120) LP mode: 4 hours (P6 – 120)
Fast forward/rewind time	Approx. 8 minutes (P6 – 120)
Image device	CCD (Charge Coupled Device)
Viewfinder	Electronic viewfinder (black and white)
Lens	Combined 6 × power zoom lens f = 7 – 42 mm (9/32 to $1^{11}/_{16}$ inches), F2.0 with macro filter diameter: 37 mm ($1^{1}/_{2}$ inches)
Auto focus system	TTL
Minimum illumination	5 lux (F 2.0)
Illumination range	5 lux – 100,000 lux (0.5 – 9,290 footcandles)
Recommended illumination	More than 150 lux (14 footcandles)
Aperture correction	Automatic

Input and output connector

Video input/output	Selectable with the INPUT/OUTPUT selector Phono jack (1) 1 Vp-p, 75 ohms unbalanced sync negative
Audio input/output	Selectable with the INPUT/OUTPUT selector Phono jack (1) Input: –7.5 dBs, input impedance more than 47 kilohms Output: –7.5 dBs, (at output impedance 47 kilohms) impedance less than 2.2 kilohms
RFU DC OUT	Special minijack, 5 V DC
REMOTE jack	Stereo mini-minijack
MIC jack	Minijack, –66dBs, low inpedance with 2.5 – 3 V DC output, impedance 6.8 kilohms

General

Power requirements	On battery mounting surface 6.0 V (battery pack) 7.5 V (AC power adaptor) 9.0 V (alkaline batteries)
Power consumption	4.8 W (camera recording) including the viewfinder
Installation	Vertically, Horizontally
Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	–20°C to +60°C (–4°F to +140°F)
Dimensions	Approx. 108 × 104 × 168 mm (w/h/d) ($4^{3}/_{8} \times 4^{1}/_{8} \times 6^{5}/_{8}$ inches)
Weight	Approx. 700 g (1 lb 9 oz) excluding the battery and cassette
Microphone	Electret condenser microphone
Supplied accessories	See page 4.

Design and specifications are subject to change without notice.

If any difficulty should arise during operation, go through the following table. Should the difficulty persist, unplug the unit and contact your Sony dealer or local authorized facility.

	Symptom	Cause	Procedure
Power	The power will not turn on.	• The battery is not attached. • The battery is exhausted. • The AC power adaptor is not connected to a wall outlet.	• Attach the battery. • Use a new battery. • Connect the adaptor to a wall outlet.
	The power turns off.	• While being operated in the CAMERA mode, the camcorder has been in the pause mode for more than 5 minutes. • The battery is exhausted.	• Turn STANDBY to LOCK once and turn it to STANDBY again. • Use a charged battery.
	The battery pack is quickly discharged.	• The ambient temperature is too low. • The battery pack has not been charged fully.	Charge the battery pack again.
Operation	START/STOP does not operate.	• The tape is affixed to the drum. • The tape is at its end. • POWER is set to VTR. • The tab on the cassette is out (red).	• Remove the cassette. • Rewind the tape or use a new one. • Set it to CAMERA. • Use a new cassette or slide the tab.
	The cassette cannot be removed from the compartment.	The battery is exhausted.	Use the charged battery or the AC power adaptor.
	No function except for cassette ejection works.	Moisture condensation has occurred. (See page 44.)	Remove the cassette and do not use the unit for at least an hour.
	The tape does not move when a tape transport button is pressed.	• POWER is set to CAMERA or OFF. • The tape is at its end.	• Set it to VTR. • Rewind the tape or use a new one.
	The autofocusing function does not work.	Shooting conditon is not suitable for autofocusing operation. (See page 26.)	Press FOCUS so that the autofocus frame disappears and adjust the focus manually.
Picture	The image on the viewfinder screen is not clear.	The viewfinder lens is not adjusted.	Adjust the viewfinder lens.
	A vertical band appears when a subject such as lights or candle flame is shot against a dark background.	The contrast between the subject and background is too high; the camcorder is not malfunctioning.	—
	The playback picture is not clear.	• EDIT is set in the direction of the arrow. • The channel for the VCR is not adjusted on the TV.	• Set EDIT in the reverse direction of the arrow. • Adjust the TV.
	The picture is noisy.	The video heads may be contaminated.	Clean the heads using the Sony V8-25CLH video head cleaning cassette. See page 45. If the V8-25CLH cleaning cassette is not available in your area, have the heads cleaned at the nearest Sony service facility.
Others	• Recording onto another tape is impossible. • Recording a TV program or recording from another tape is impossible.	• The INPUT/OUTPUT selector is set to INPUT. • The INPUT/OUTPUT selector is set to OUTPUT.	• Set to OUTPUT. • Set to INPUT.
	There is dust inside the viewfinder.	—	Pull out the viewfinder and clean the viewfinder screen cover or viewfinder lens. (See page 9.)

If an indication blinks on the viewfinder screen or a caution lamp on the main unit blinks, check the following table.

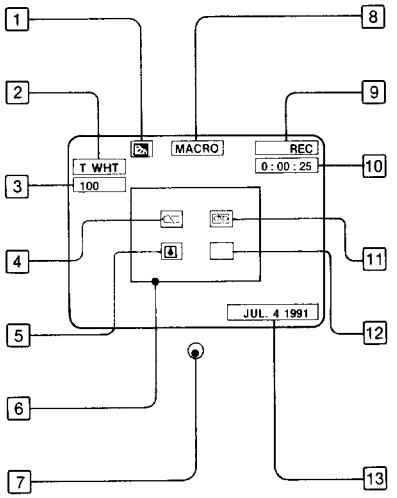
☐ fast blinking ☐ slow blinking

Display in the viewfinder and caution lamp	Cause	Corrective action
☐, Battery lamp	The battery is weak.	Prepare a charged one.
☐, Battery lamp	The battery is used up.	Use a charged battery.
☐, Battery lamp	The tape is near its end.	Prepare a new one.
☐ ⏏, Battery lamp	The tape is at its end.	Use a new tape.
☐	No tape is inserted.	Insert a tape.
☐ ⏏	The tab on the tape is out (red).	Slide the tab back or use a new tape.
☐, ⏏, DEW lamp	Moisture condensation has occurred.	Remove the tape and do not operate the camcorder for at least 1 hour.
⏏, DEW lamp	Moisture condensed on the tape.	Remove the tape and do not operate the camcorder for at least 1 hour.
⊗, Caution lamp	The gap of the head is clogged.	Clean the head using the Sony V8-25CLH cleaning tape.
⏏, Caution lamp	Other trouble may occur.	Turn off the camcorder and remove the battery. Then attach the battery again. If the lamp still blinks, consult your nearest Sony dealer.

Display in the viewfinder	Cause	Corrective action
"AM 12:00:00" blinks for 5 seconds after setting POWER to CAMERA.	The lithium battery is not installed. The lithium battery is exhausted.	Install a battery or new battery.
The current time blinks for 5 seconds after setting POWER to CAMERA.	The lithium battery is weak.	Install a new battery.

Indications Inside the Viewfinder

(T)



(T)

1 BACK LIGHT is pressed.
2 Title color
3 Shutter speed
4 "Replace battery."
5 Moisture condensation
6 Autofocus adjusting range
Goes out during manual focusing
7 Lights up during recording.
When blinking: "Replace battery."
8 In the MACRO range
9 Tape transport and camera recording mode
10 Tape counter (for camera recording)
11 "Exchange tape."
12 "Clean video heads." or other caution (⊗, ⏏)
13 Date or time